FLIGHT SUMMARY REPORT

Flight Number: 99-003

Calendar/Julian Date: 26 October 1998 • 299

Sensor Package: Wild Heerbrugg RC-10
Dual Hycon HR-732
Thematic Mapper Simulator (TMS)

Area(s) Covered: Vandenberg AFB

Investigator(s): Fisher, DOD **Aircraft #:** 806

SENSOR DATA

Accession #:	05318	05319	05320	-----
Sensor ID #:	076	020	039	074
Sensor Type:	RC-10	HR-732	HR-732	TMS
Focal Length:	12” 304.89 mm	24” 609 mm	24” 609 mm	-----
Film Type:	Aerochrome IR SO-134	Aerochrome MS EK 2448	Panatomic X Aerographic II EK 2412	-----
Filtration:	Wratten 12	None	Wratten 12	-----
Spectral Band:	510-900 nm	400-700 nm	510-700 nm	-----
f Stop:	11	16	10	-----
Shutter Speed:	1/250	1/250	1/250	-----
# of Frames:	62	136	126	-----
% Overlap:	60	60	60	-----
Quality:	Excellent	Excellent	Excellent	Excellent
Remarks:	Subtract 8 seconds for correct UTC	Add 4 seconds for correct UTC	Add 24 seconds for correct UTC	

Airborne Science and Applications Program

The Airborne Science Program at NASA's Dryden Flight Research Center, Edwards, California, operates two ER-2 high altitude aircraft in support of NASA earth science research. The ER-2s are used as readily deployable high altitude sensor platforms to collect remote sensing and in situ data on earth resources, celestial phenomena, atmospheric dynamics, and oceanic processes. Additionally, these aircraft are used for electronic sensor research and development and satellite investigative support.

The ER-2s are flown from various deployment sites in support of scientific research sponsored by NASA and other federal, state, university, and industry investigators. Data are collected from deployment sites in Kansas, Texas, Virginia, Florida, and Alaska. Cooperative international scientific projects have deployed the aircraft to sites in Great Britain, Australia, Chile, and Norway.

Photographic and digital imaging sensors are flown aboard the ER-2s in support of research objectives defined by the sponsoring investigators. High resolution mapping cameras and digital multispectral imaging sensors are utilized in a variety of configurations in the ER-2s' four pressurized experiment compartments. The following provides a description of the digital multispectral sensor(s) and camera(s) used for data collection during this flight.

Thematic Mapper Simulator

The Daedalus Thematic Mapper Simulator (TMS) is a multispectral scanner flown aboard the ER-2 aircraft which simulates spatial and spectral characteristics of the seven Landsat-D Thematic Mapper bands. The specific bands are as follows:

Daedalus Channel	TM Band	Wavelength, μm
1	A	0.42 - 0.45
2	1	0.45 - 0.52
3	2	0.52 - 0.60
4	B	0.60 - 0.62
5	3	0.63 - 0.69
6	C	0.69 - 0.75
7	4	0.76 - 0.90
8	D	0.91 - 1.05
9	5	1.55 - 1.75
10	7	2.08 - 2.35
11	6	8.5 - 14.0 low gain
12	6	8.5 - 14.0 high gain

Sensor/aircraft parameters are as follows:

IFOV:	1.25 mrad
Ground Resolution:	81 feet (25 meters) at 65,000 feet
Total Scan Angle:	43^{o}
Swath Width:	8.4 nmi (15.6 km) at 65,000 feet
Pixels/Scan Line:	716
Scan Rate:	12.5 scans/second
Ground Speed:	400 kts (206 m/second)

Camera Systems

Various camera systems and films are used for photographic data collection. Film types include high definition color infrared, natural color, and black and white emulsions. Available photographic systems are as follows:

- Wild-Heerbrugg RC-10 metric mapping camera
  - 9 x 9 inch film format
  - 6 inch focal length lens provides area coverage of 16 x 16 nautical miles from 65,000 feet
  - 12 inch focal length lens provides area coverage of 8 x 8 nautical miles from 65,000 feet

- Hycon HR-732 large scale mapping camera
  - 9 x 18 inch film format
  - 24 inch focal length lens provides area coverage of 4 x 8 nautical miles from 65,000 feet

- IRIS II Panoramic camera
  - 4.5 x 34.7 inch film format
  - 24 inch focal length lens
  - 90 degree field of view provides area coverage of 2 x 21.4 nautical miles from 65,000 feet

Data Availability

The U.S. Geological Survey's EROS Data Center at Sioux Falls, South Dakota serves as the archive and product distribution facility for Airborne Science Program aircraft acquired photographic and digital imagery. The photographic archive consists of photography acquired by the program from 1971 to April 1996. For information regarding photography and digital data (including areas of coverage, products, and product costs) contact EROS Data Center, Customer Services, Sioux Falls, South Dakota 57198 (Telephone: 605-594-6151).

As of April 1996 the EROS Data Center no longer receives an archive copy of newly acquired Airborne Science Program photography. Original photography is archived with the Airborne Sensor Facility at Ames Research Center. A user copy of the photography is provided to the principal investigators for each flight. Principal investigators are cited on the first page of their respective flight summary reports. For information regarding photography acquired from April 1996 to the present contact the Airborne Sensor Facility as follows:

Flight Documentation and Data Archive Searches

The following is the web site for flight documentation as published by the Airborne Sensor Facility at NASA Ames Research Center: http://asapdata.arc.nasa.gov/er-2fsr.html

Additional information regarding flight documentation to include data archive searches, data availability, sensor parameters, and areas of coverage may be obtained from the following:
Airborne Sensor Facility, MS 240-6, NASA Ames Research Center, Moffett Field, CA 94035-1000, Telephone: 650.604.6252 (FAX 4987).

CAMERA FLIGHT LINE DATA
FLIGHT NO. 99-003

Accession # 05318

Sensor # 076

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
D - C	0229-0241	19:30:47	19:36:24	63600/19385	Clear
B - A	0242-0261	19:39:43	19:48:12	64950/19797	10-40% cumulus (frames 0242-0255)
E - F	0262-0277	19:51:58	19:58:34	64925/19789	Clear; static discharge (frame 0277)
G - H	0278-0290	20:02:01	20:07:12	64192/19566	Clear; oblique (frames 0278-0279)

CAMERA FLIGHT LINE DATA
FLIGHT NO. 99-003

Accession # 05319

Sensor # 020

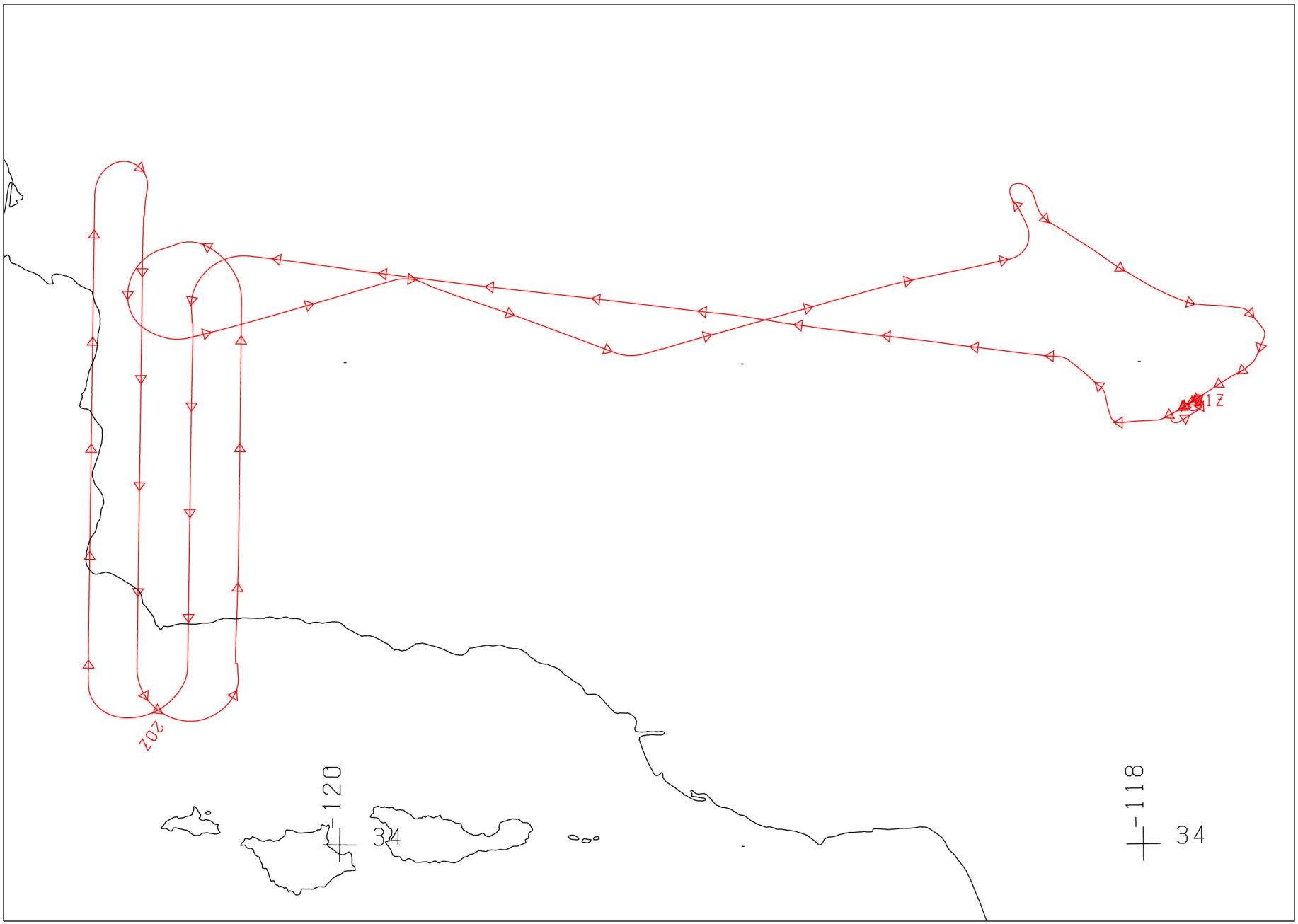
Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
D - C	0001-0026	19:30:26	19:36:29	63612/19389	Clear
B - A	0027-0062	19:39:40	19:48:07	64978/19805	10-50% cumulus (frames 0027-0043); 10% cumulus (frames 0046-0049)
E - F	0063-0091	19:51:55	19:58:41	64955/19798	Clear
G - H	0092-0118	20:01:58	20:08:14	64207/19570	Clear; oblique (frame 0092)
D - I	0119-0136	20:13:56	20:18:18	64256/19585	10-20% cumulus (frames 0130-0133); oblique (frames 0134-0136)

CAMERA FLIGHT LINE DATA
FLIGHT NO. 99-003

Accession # 05320

Sensor # 039

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
D - C	0001-0026	19:30:07	19:36:10	63612/19389	Clear
B - A	0027-0062	19:39:20	19:47:48	64981/19806	10-50% cumulus (frames 0027-0043); 10% cumulus (frames 0046-0049)
E - F	0063-0091	19:51:35	19:58:21	64959/19800	Clear
G - H	0092-0118	20:01:39	20:07:55	64207/19570	Clear; oblique (frame 0092)
D - J	0119-0126	20:13:37	20:15:18	64188/19565	Clear



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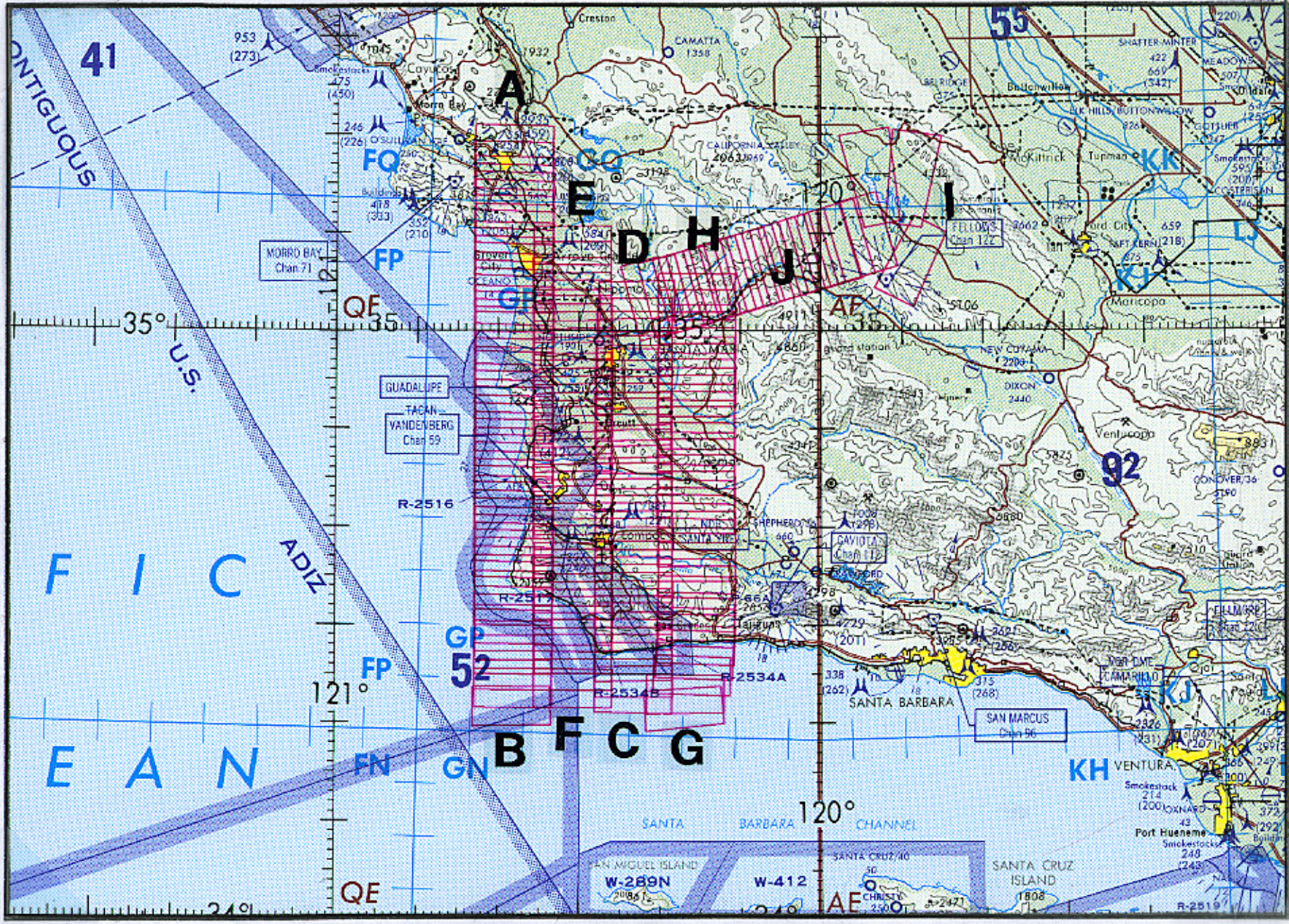

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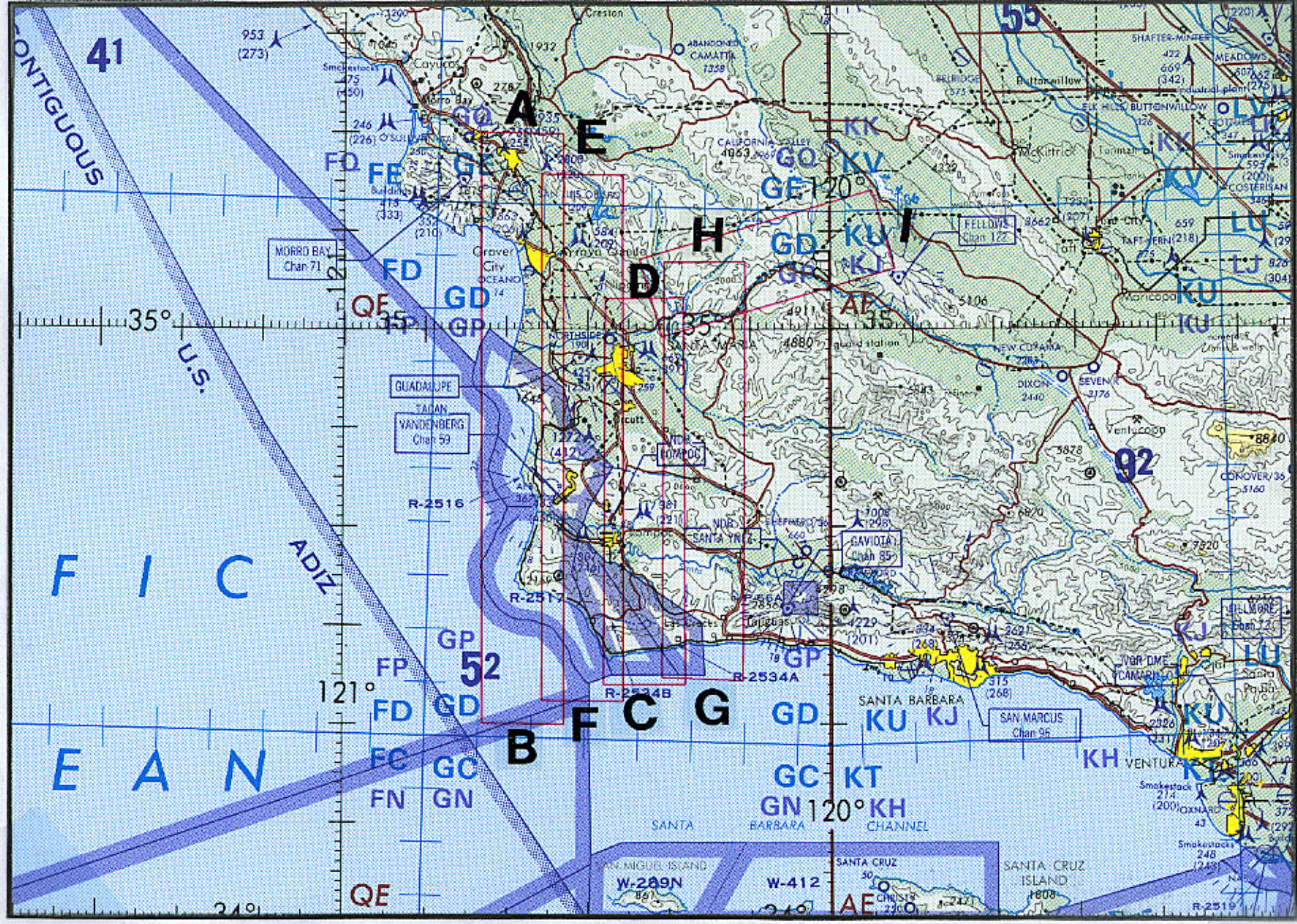

FLIGHT 99-003 26 OCTOBER 1998 A/C 806 TMS ONC G-16